

CLAIMS

1. A process for the production of a polysiloxane containing mass incorporating surface treated filler materials comprising feeding materials to a change can mixer in which the materials are mixed; the change can mixer comprising a detachable mixing head assembly containing least two spiral mixing arms extending downwardly into the can of the change can mixer, drive means for rotating the spiral mixing arms around their own axis, and drive means for rotating the spiral mixing arms as a unit around the axis of the can and wherein the geometry of the mixing arms is such that they generate downwardly directing motion on the composition being mixed, the materials being mixed to form the mixture in the change can mixer comprising:
  - (i) a polysiloxane having more than 40 siloxane units, which is selected from the group consisting of trialkylsilyl end blocked polysiloxanes, and polysiloxanes having at least one silicon bonded alkenyl group, hydroxyl group, and hydrolysable group;
  - (ii) a reinforcing filler material selected from the group consisting of finely divided silica, surface treated finely divided silica, calcium carbonate, surface treated finely divided calcium carbonate, quartz powder, aluminium hydroxide, zirconium silicate, diatomaceous earth, and titanium dioxide;
  - (iii) an hydrophobing agent selected from the group consisting of disilazanes and polydiorganosiloxanes having 2-40 siloxane units having silicon bonded hydroxyl groups or amino groups;

with the proviso that each of the materials (i)-(iii) are fed into the change can mixer as the material itself, or as a mixture containing one or more of materials (i)-(iii).

2. A process in accordance with claim 1 wherein the change can comprises one or more perforations therein.
3. A process in accordance with claim 2 wherein a resulting mixture is stripped by passing an inert gas through said perforation(s) into said mixture during and/or after the mixing process.

4. A process in accordance with claim 2 or 3 wherein, subsequent to mixing, a resulting mixture is extruded through said perforations by means of a suitable press.
5. A process in accordance with claim 4 wherein the press is a pot press.
6. A process in accordance with any preceding claim wherein after mixing the mixture is conveyed to a de-airing unit for the removal of gaseous materials from the mixture.
7. A process in accordance with any preceding claim wherein after mixing the resulting mixture is conveyed into and through a means for introducing additives into the mixture.
8. A process in accordance with claim 7 wherein the means for introducing additives into the mixture comprises a single screw extruder comprising
  - a) an elongate barrel having an inlet for introducing a polymer into the extruder and an outlet for discharging extruded polymer from the barrel
  - b) a rotatable screw axially disposed within the barrel for advancing polymer in the extruder from the inlet to the outlet
  - c) one or more additive introduction means for introducing at least one additive at one or more predefined positions along the barrel of the single screw extruder between the inlet and the outlet

wherein

immediately upstream of the or each additive introduction means there is provided, on or around the screw, a plug having a plurality of apertures, said plug being adapted such that, in use, the only way for polymer or polymer/additive mixture to move downstream of the plug is by passing through the apertures and that, having passed through the apertures, the polymer or polymer/additive mixture is subjected to a reduction in pressure and is simultaneously mixed with an additive from the one or more additive introduction means prior to transportation of the resulting polymer additive mixture to the outlet.

9. A process in accordance with claim 7 wherein the means for introducing additives into the mixture is an apparatus for continuously preparing viscous compositions containing additives comprising:
- (i) a mixing device for uniformly mixing and dispersing an additive into a viscous fluid;
  - (ii) one or more servo motor driven pumps for feeding the viscous fluid to the mixing device;
  - (iii) one or more servo motor driven pumps for feeding the additive to the mixing device;
  - (iv) means for supplying the viscous fluid to the viscous fluid servo motor driven pumps;
  - (v) means for supplying the additive to the additive servo motor driven pumps;
  - (vi) means for dispensing a viscous composition containing the fluid and the additive from the mixing device into a container;
  - (vii) a programmable logic computer, constructed and arranged to control the operation of the servo motor driven pumps for the viscous fluid and the servo motor driven pumps for the additive, so that a predetermined ratio of RPM between the servo motor driven pumps for the viscous fluid and the servo motor driven pumps for the additive, is maintained irrespective of pressure surges in the supply means for the viscous fluid and supply means for the additive; and
  - (viii) a temperature compensation algorithm for compensating fluctuations in temperature of the viscous fluid.
10. A process according to any preceding claim in which the finely divided filler comprises fumed silica or precipitated silica.
11. A process according to any preceding claim in which the mixture is in the form of a paste or a powder.
12. A process according to any preceding Claim in which the materials being mixed to form the mixture in the change can mixer include water.
13. A process according to any preceding claim in which the mixture is further compounded with one or more other materials comprising curative agents, catalysts, inhibitors, plasticising agents, extending agents, and non-reinforcing fillers, to provide a curable product.

14. A process according to any preceding Claim in which the change can mixer contains 2-5 spiral mixing arms extending downwardly into the can of the change can mixer.
15. A process according to Claim 14 in which the change can mixer contains three spiral mixing arms spaced 120 degrees apart circumferentially with respect to the centre line of the can of the change can mixer.
16. A process according to any preceding claim in which the mixing tools carry a non metallic edge to avoid build up of material on the pot walls.
17. Use of a change can mixer comprising a detachable mixing head assembly containing least two spiral mixing arms extending downwardly into the can of the change can mixer, drive means for rotating the spiral mixing arms around their own axis, and drive means for rotating the spiral mixing arms as a unit around the axis of the can and wherein the geometry of the mixing arms is such that they generate downwardly directing motion on the composition being mixed, as a batch mixer in a process for the production of a polysiloxane containing mass incorporating surface treated filler.